International Journal of Instruction *October 2024 ● Vol.17, No.4*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 573-594

Article submission code: 20240205183317
Received: 05/02/2024 Revision: 10/06/2024
Accepted: 13/06/2024 OnlineFirst: 01/07/2024

Construction, evidence of validity and reliability of a Teacher Socioemotional Competencies Scale - ECSED

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Social-emotional competencies are complex actions that include skills, knowledge and attitudes to maintain effective and satisfactory social interactions. As well as, managing one's own and other people's emotions in different environments. They are vital for healthy coexistence in higher education. The purpose of this research was to establish the evidence of validity and reliability for the scale of socioemotional competencies of university teachers. Scale constructed under the pentagonal model approach of Bizquerra and Pérez (2007). The study is cross-sectional and instrumental. A non-probabilistic convenience sample of 237 teachers from public and private universities in Lima (Peru), from different professional careers, aged between 24 and 70 years, male and female, was used. Satisfactory evidence of content-based validity was found for the criteria of clarity, pertinence, and relevance for each of the items using Aiken's V technique. For validity based on the internal structure of the construct, a Penta dimensional model and a bi-factor model were contrasted by confirmatory factor analysis, with better fit values for the second model (CFI and TLI > 0.95, RMSEA and SRMR < 0.07, = ω h = 0.90, ECV and PUC > 0.95), and favorable evidence of convergent and discriminant validity was also found. For both the overall score and the scores for each factor, there were coefficients denoting high reliability (ordinal α and ω > 0.90).

Keywords: social-emotional competencies, university teachers, emotional intelligence, social skills, validity, reliability, bi-factor

Citation: Montes de Oca, J. H., Capa-Luque, W., Deza-Villanueva, S., Rodriguez-Saavedra, L., & Tirado, J. J. (2024). Construction, evidence of validity and reliability of a teacher socioemotional competencies scale - ECSED. *International Journal of Instruction*, *17*(4), 573-594. https://doi.org/10.29333/iji.2024.17432a

INTRODUCTION

In today's world, education is relevant to generate the socioemotional and cognitive development of the student. A key factor in this educational process are the competencies expected of a university teacher, which must be aligned with the educational proposal, institutional values, and the profile of achievement of students' graduation competencies. In this regard, García (2017) propose, within the framework of university teacher training, a renewed conception of the curriculum, understood as a set of experiences that enable the development of the basic competencies necessary to solve complex situations for effective professional performance, in a changing social context.

For this reason, the socioemotional competencies of teachers are essential to promote social and emotional competencies in students so that they become productive and responsible citizens, with themselves, with other people and with the planet. Thus, in the contemporary university context, UNESCO (2019) raises the ICT competencies of teachers for digital education. It prioritizes three levels of development of teaching competencies: The first level is knowledge acquisition, to encourage students in managing their learning to become productive members of society. It demands from the teacher, socioemotional competencies of self-motivation and empathy, tolerance with students. Duisembekova (2021), demonstrated that good teachers are those whose hearts possess the attention and desire to help both students and other teachers and people in the educational and social environment, reflecting a good sense of autonomy.

The second level is of competencies, it seeks the deepening of knowledge, where students of different abilities, ages, gender, and socio-cultural and linguistic backgrounds, apply knowledge to solve complex and priority problems. The third level is knowledge creation, where problem-solving skills, assertive communication, collaboration, critical judgment, and creative expression should be prioritized. Likewise, skills are very important and necessary for a university teacher to possess high quality functional competence, for which he/she must have a comprehensive knowledge about the aspects of his/her work as a teacher (Ismail et al.,2018).

In this current context, the International Network for Emotional Education and Well-being (2021) mentions that people who possess emotional competencies are better able to face life's challenges and contribute effectively to the construction of personal and social well-being. Likewise, Arias et al. (2020) point out that the teaching of transversal competencies is integrated into initial teacher training; however, teachers do not feel prepared to teach them. In Latin America, the percentage of teachers who receive training in transversal competencies is 87%; however, after receiving initial training, most of them did not feel prepared to teach transversal competencies (Arias et al., 2020). In sum, the training received by teachers is insufficient to effectively face their formative work in educational institutions.

Caballero and Llorent (2022) suggest the need to develop socioemotional competencies explicitly, with specific socioemotional training for students; in this sense, teachers with

high transversal competencies are required to establish effective interactions that promote the socioemotional development of students. In this line, Denston et al. (2022) affirm that teachers' self-concept and socioemotional competencies can influence the way in which teachers interact and promote students' socioemotional well-being.

According to Bisquerra (2005), the educational institution has a formative responsibility. Thus, the emotional education proposal seeks to develop emotional competencies. This comprises a constant educational process to strengthen the development of socio-emotional competencies that contribute to the integral development of the teacher and enable him/her to achieve integral education, improve the quality of life and increase personal and social wellbeing. It is essential that it be included in the professional training curriculum.

In such reason, the results of studies on the development of socioemotional competencies confirm that it is necessary to build in the classroom, conditions to face challenges of professional life and solve complicated situations; and on the other hand, to avoid situations of stress, anxiety, and emotional alterations (García, 2017). In this regard, in another study by Bressan and Chao (2021) found in Colombia that 62% of high school teachers considered that the development of socioemotional skills provided students with more resources to prevent and manage risk situations; therefore, there is a need for teacher training oriented towards didactics and specific methodology of socioemotional education.

Consequently, the construction of instruments to evaluate the socioemotional competencies of teachers is a necessity to achieve the fundamental purpose of guiding teachers. This contributes to their full development, promotes self-reflection, and reinforces their professionalism; likewise, it is one of the main pillars that sustains effective motivation for student learning. "In the training process, in addition to the preparation in methodological skills, there is something more intangible, the inner world of each professional that contributes dimensions that complement and enrich it" (Pujol, 2021, p.101).

Theoretical Framework

The basic theoretical model that supports the construction of the scale of socioemotional competence of teachers postulates that socioemotional competencies are learned through social interaction and critical reflection on how they relate to students. Thus, they learn to relate more effectively by living social and teaching-learning experiences, mediated by other colleagues, by receiving feedback from students, on which they reflect on how they are behaving. Likewise, their expectations to improve the way they relate to each other daily, as well as how they think about their own emotions and those of others, to better manage their emotions, their self-motivation and to influence students' emotions. SES include the skills to understand, express and effectively regulate emotions, interpersonal relationships, and skills to generate well-being for oneself and others. In this sense, socioemotional competencies are fundamental for the full development and ethical exercise of citizenship; their mastery contributes to better adaptation to the context and favors effective coping in different life circumstances (Lorent, et al. 2020) and learning through social interaction (Lozano, et al., 2021).

These socioemotional competencies, according to the pentagonal model of Bisquerra and Pérez (2007), are effective actions that include skills, knowledge, and attitudes, and propose five types of competencies: emotional awareness, emotional regulation, personal autonomy, social competence and competencies for life and well-being. They, are evidenced in everyday practice, learned, and developed in the interaction itself, and critical reflection on such practice, can be changed and improved. Collie (2019) in this line, reaffirms that socioemotional competencies are defined as the effective management of intrapersonal and interpersonal social and emotional experiences, which strengthen both one's own well-being and that of other people. There are multiple social, economic, family factors that affect the motivation of teachers, making them feel undervalued in society affecting their sense of self-efficacy, self-esteem, self-confidence, added to this the low salary (Gobena, 2018).

According to Bisquerra and Pérez (2007), the emotional competencies that teachers need to develop; and that are considered for the construction of the instrument of this study, by one of the authors of this study (Montes de Oca, 2023), which are the following:

1) Recognition of one's own and others' emotions. This means accurately perceiving one's own feelings and emotions; identifying them associated with specific situations and labeling them. Likewise, the emotions of other people. In this regard, Bisquerra and Pérez (2007) also analyzes emotional awareness as a fundamental dimension for coping with difficult situations and relating to others.

2) Emotional regulation. It is expressing emotions in a way that is relevant to the situation, modulating emotional responses to difficult situations. It involves the use of coping strategies; self-generating positive emotions, regulating impulsivity, persevering in the achievement of goals and tolerance to frustration to prevent negative emotional states such as anger, stress, or depression. In this way, Bisquerra and Pérez (2007) consider this dimension of emotional regulation to be relevant for interacting effectively in difficult or new situations that demand calmness to make functional decisions.

3) Emotional autonomy. It is interacting with freedom and responsibility, making decisions in a reflective way and assuming the consequences. It focuses on relevant self-worth, with a positive attitude towards life, with a willingness to engage in safe, healthy, and ethical behaviors. Likewise, Bisquerra and Pérez (2007) propose critical reflection to achieve success in daily social activities that require agreements or conflict resolution.

4) Social competence. It is the set of effective and mutually satisfactory social skills, such as communicating in an assertive and empathetic way and feeling an important member of a group. It involves maintaining respectful relationships with others, resisting group pressure, and avoiding situations of coercion. It includes preventing and dealing with conflicts. In this line, Collie (2019) values as a dimension, the effective management of social and emotional experiences to improve intrapersonal and interpersonal aspects of the teacher.

5) Competences for life and well-being. It includes interacting with healthy eating situations, searching for peers willing to support each other to generate greater personal and social development, in favor of a better quality of life, concretized in positive and viable goals. Make reflective decisions considering the ethical dimension in personal, family, academic, professional, social and leisure time situations. These aspects are revalued by Collie (2019) who focuses on consolidating one's own well-being, as much as that of other people, adding a vision of collective benefit.

When addressing the concept of socioemotional competencies, it is essential to understand that they are built in the relationship with others. As Delgado and López (2022) refer, the quality and tendency of each interaction is influenced by the history of interactions of each person; and it also depends on their expectations regarding their future interactions where affective and cognitive processes intervene. They are determined by relationships of mutual influence. In this sense, the positive or negative feedback between teacher and student in a particular educational institution, mediated by the conventions of the organization's culture and the social context in general, becomes important.

The scientific literature reports different previous research on the construction of socioemotional competency instruments: Fernández and Malvar (2019) constructed in Spain, the scale of emotional competencies of counselors, considering 4 levels of gradation. The dimensions included self-knowledge, entrepreneurial attitude, dynamism and collaboration, pragmatic and problem-solving attitude, integrity and human values and ethics. They were applied to 185 guidance teachers. The content validity was assessed by experts. Likewise, with the AFE, they found 10 factors with eigenvalues greater than 1, which together explain 70.04% of the variance. As for the AFC, they used Unweighted Least Squares -ULS-, and found factor loadings above 0.60. In addition, high correlation values between factors (0.70 and 0.80). However, this instrument was designed for elementary school teachers, in addition to reporting adjustment indexes with biases for validity based on the internal structure of the construct, as well as not performing invariance analysis.

Previously, a relevant study is that of Mikulic et al. (2015) who constructed the Inventory of Socioemotional Competencies (ICSE). They obtained content validity from 18 judges. The sample was 509 adults, aged 18 to 65 years, from Buenos Aires. They found a matrix of items with factorial weights above .30. The existence of 9 factors explaining 42.57% of the total variance was evidenced: the dimensions of self-efficacy, optimism, assertiveness, emotional expression, emotional awareness, empathy, emotional regulation, prosocial and autonomy. Values between .60 and .87 were found for these dimensions, and .89 for the total instrument variable. The ICSE design presents methodological limitations such as the use of principal component analysis, a technique that is not recommended to evaluate the factorial structure of a construct (Lloret-Segura et al., 2014), and the sample used was not made up of university teachers.

Likewise, Yataco et al. (2022) reported, the validation of a Socioemotional Competencies instrument (SEC-Q), based on 16 items, which was previously adapted

by Zych et al. (2018; cited by Yataco, 2022). With an incidental sample of 196 teachers from 18 schools. When performing the AFE, with Kaiser-Meyer-Olkin, they obtained an index of 0.932, with high correlation between items. Males showed a higher level than females in the factors evaluated. When validity was performed by confirmatory factor analysis, high factor loadings were obtained (λ = .63 to .95), with an internal structure of four factors. A good fit to the data was confirmed in the dimensions of self-knowledge, self-motivation and self-management, social awareness and prosocial behavior, and decision-making. Among the limitations of the study is the use of an estimation method (maximum likelihood) suggested for data with normal distribution; however, the data for SEC-Q are categorical and without normal distribution. In addition, this questionnaire was designed for regular elementary school teachers.

Considering the analysis of the current educational situation and the background reviewed, this study is relevant because it fills a large methodological gap in the evaluation of socioemotional competencies of university teachers. There are no instruments based on a solid substantive theory, nor do they meet the methodological and statistical standards of current psychometrics, and above all, they do not measure the socioemotional competencies of university teachers. Therefore, the contribution of this study is very important with the construction of an instrument to measure the socioemotional competencies of teachers, as a key factor to evaluate the socioemotional development of the teacher himself and fundamental for making decisions in the continuous improvement of the teaching and learning process in higher education.

Accordingly, the objectives of the present study were: 1) To evaluate the evidence of content-based validity, internal structure of the construct, convergent and discriminant validity for the scores of the Scale of Socioemotional Competencies of the Teacher, 2) To evaluate the evidence of reliability for the scores of the Scale of Socioemotional Competencies of the Teacher.

METHOD

The present study was cross-sectional and instrumental (Ato et al., 2013). Specifically, it is psychometric research, in which the survey technique was used, and the instrument is a scale that measures SES in five levels of gradation.

The population corresponds to teachers from three universities in Lima, Peru (one public and two private), where they taught psychology and education.

A total of 237 teachers, ranging in age from 24 to 70 years, both male and female, participated in the study. The majority of the teachers had a degree in psychology (66%). Also, 30% of the teachers had only a bachelor's degree, 49.4% had a master's degree and 20.6% had a doctoral degree.

The sampling was non-probabilistic by convenience. Only teachers who voluntarily accepted and signed virtually their informed consent to participate in the study were included. The sample size meets the minimum recommended for psychometric studies (Lloret-Segura et al., 2014).

Instrument

Sociodemographic data sheet, designed ad hoc to collect data such as age, sex and academic degree of the teacher (bachelor's, master's, doctorate).

Scale of Socioemotional Competencies of the Teacher - ECSED, was constructed by Montes de Oca in 2022, who conducted a pilot analysis of validation and reliability, which was presented at the Inter-American Congress of Psychology (Montes de Oca, 2023). The objective of the instrument is to measure the socioemotional competencies of the teacher, through a Likert-type scale of five factors ranging from never (1) to always (5). The initial version of the scale comprised 75 items grouped into five dimensions. After the psychometric study, the final version consisted of 28 items distributed in five dimensions: Recognition of own and others' emotions, Emotional regulation, Emotional autonomy, social competence and Competences for life and well-being.

The total score and the factors are obtained by direct summation. The higher the score, the greater the development of socioemotional competencies in the teacher.

Procedure

In accordance with the chosen theoretical perspective and the pentagonal model proposed by Bisquerra and Perez (2007), the scale was constructed based on the five dimensions mentioned above. A total of 75 items were initially drafted, with 15 items for each dimension. After the pilot study by means of qualitative analysis of the items with the participation of three specialists in the thematic content of the construct to be measured, 55% of the items were discarded due to ambiguity in the wording of the items, low relevance, or relevance, leaving the final version of the scale for the psychometric study with 34 items. The items were then adapted in a Google form, with the mention of informed consent and general data. The test was applied virtually. The sample was taken in the second two-month period of the year 2022.

Data Analysis

Based on the data constructed, a descriptive analysis was performed to obtain evidence of asymmetry and kurtosis, considering as accepted values between +1.5 and -1.5. Likewise, the adjusted item-test correlation was analyzed, with items with indexes $\geq$ 0.30 being considered of adequate discriminative quality (Ferrando et al., 2022).

To obtain evidence of validity based on the content of the scale, the items were submitted to the evaluation of 8 experts, who assessed the items according to the criteria of clarity, pertinence, and relevance. Quantitative evidence of this validation was synthesized using Aiken's V statistic. Agreement among the judges was considered adequate for a cut-off point of 0.70 for the point estimate and a minimum cut-off value of 0.59 for the lower limit of the 95% confidence interval (Penfield & Giacobbi, 2004).

Regarding the exploratory factor analysis, the treatment and analysis of the data was carried out with the program Factor Analysis version 12.04.05 (Lorenzo-Seva & Ferrando, 2006). The "diagonally robust weighted least squares" - RDWLS extraction method was used, which is recommended for ordinal scales and non-normality

conditions (Yang-Wallentin et al., 2010). For factor extraction, "parallel analysis" was applied, with a robust Promin rotation method (Lorenzo-Seva & Ferrando, 2019). The evaluation of the factorial model found was performed by balancing the factor loadings per item, the CFI and GFI fit indices, and the residual analysis through RMSR and WRMR (Abad et al., 2011; Yu & Muthen, 2002).

Using the program R version 4.3.1 (R Core Team, 2023) and the RStudio environment version 2023.06.2 (RStudio Team, 2020), a five-factor multidimensional model was first examined with the confirmatory factor analysis strategy. The estimator chosen was "Diagonally weighted least squares mean and variance corrected" - WLSMV (Brown, 2015). Given the presence of high interfactor covariances a bi-factor model with the WLSMV estimator was examined at a second stage. The indices for the overall evaluation of the two models were the Chi-squared goodness-of-fit test ($\chi 2$) and the recommended robust fit indices such as CFI (Comparative Fit Index), TLI (Tucker Lewis Index), RMSEA (Root Mean Square Error of Approximation) and SRMR (Standardized Root Mean Square Residual). The first two robust indices denote acceptable fit if it presents values ≥ 0.90 and very good fit when it is ≥ 0.95 (Hu & Bentler, 1999); the other two indices indicate adequate fit when they present values ≤ 0.08, good fit if RMSEA presents index ≤ 0.05 and for SRMR good fit if it is ≤ 0.06 (Hu & Bentler, 1999).

Additionally, in the bifactor model other measures recommended by Canivez (2016) such as hierarchical omega ($\omega h \geq 0.70$), hierarchical H coefficient ($Hh \geq 0.70$), common variance explained ($ECV \geq 0.60$) and the percentage of uncontaminated correlations ($PUC > 0.60$) were examined. With reference to reliability, it was evaluated as internal consistency, by means of the ordinal alpha coefficients ($\alpha \geq .08$) and their confidence intervals (Oliden and Zumbo, 2008), and McDonald's omega ($\omega \geq .08$). For the bifactor model, the hierarchical omega (ωh) and the hierarchical H coefficient (Hh) were used.

Ethical Aspects

This study was carried out considering the ethical principles contemplated in the Declaration of Helsinki. The integrity and autonomy of the informants were always respected, and they were treated with respect and dignity. They were clearly and concisely informed about the objective and purpose of their participation, as well as the benefits of the research. The confidentiality of the participants' personal data was guaranteed, with measures to protect their privacy. Likewise, all the information provided in this document guarantees the academic integrity and credibility of the results.

FINDINGS

Item analysis

Table 1 shows that the values of skewness (g1) and kurtosis (g2) denote a distribution of items with a tendency to univariate normality because they do not exceed the range of ± 1.5. On the other hand, according to the values of the corrected homogeneity index (CHI), all the items have a high discriminative capacity because they are higher than the recommended critical threshold of 0.30 (Muñiz et al., 2005).

Table 1
Descriptive analysis of the items

Ítem	Media ± DE	g1	g2	IHC
1. I identify my emotions in different situations of my teaching work.	4.23 ± 0.69	-0.34	-0.88	0.67
2. I understand the emotions I feel in the institution where I work.	4.18 ± 0.73	-0.48	-0.31	0.62
3. I realize my feelings towards my students in different conflicts.	4.12 ± 0.73	-0.59	0.26	0.62
4. I identify my appropriate emotions to manage appropriate learning.	4.09 ± 0.72	-0.54	0.27	0.67
5. I know what situations are conducive to joy to share with students.	4.05 ± 0.69	-0.06	-0.89	0.61
6. I identify my students' emotions to better communicate with them.	3.98 ± 0.79	-0.28	-0.63	0.45
7. I modulate my emotional response in situations that make me feel bad.	3.99 ± 0.76	-0.51	0.12	0.63
8. I know what situations are conducive to joy to share with students.	4.31 ± 0.64	-0.39	-0.69	0.63
9. I regulate my emotions of anger or sadness in order to relate better to students.	4.22 ± 0.78	-0.62	-0.46	0.66
10. I act empathetically when students express overflowing emotions.	4.12 ± 0.75	-0.62	0.22	0.50
11. I manage my emotions with students in situations of conflict in the classroom.	4.29 ± 0.63	-0.41	-0.13	0.58
12. When I feel an emotion that upsets me (anger, sadness, fear), I seek positive thinking to calm myself.	4.15 ± 0.77	-0.66	0.06	0.62
13. When I make a mistake in doing something in the classroom, I correct it and move forward with optimism.	4.33 ± 0.64	-0.62	0.29	0.61
14. Before making decisions, I evaluate the advantages and disadvantages of each option.	4.10 ± 0.70	-0.14	-0.94	0.48
15. I take on daily challenges that arise with a positive attitude and responsibility.	4.40 ± 0.72	-1.03	0.70	0.73
16. When something goes wrong, I make autonomous decisions to correct them for the benefit of the students.	4.26 ± 0.70	-0.40	-0.90	0.68
17. I reflect to self-motivate myself in the continuous improvement of my teaching strategies.	4.33 ± 0.63	-0.41	-0.68	0.74
18. I seek to create positive thoughts, even when things do not go as planned.	4.20 ± 0.73	-0.33	-1.07	0.71
19. I make reflective decisions to improve my teaching performance.	4.30 ± 0.69	-0.48	-0.83	0.66
20. I am self-motivated to take on a new challenge either academically or personally.	4.41 ± 0.61	-0.52	-0.62	0.62
21. When a problem arises, I evaluate different, mutually beneficial solutions.	4.21 ± 0.61	-0.14	-0.49	0.66
22. I let people know that I care or am concerned about them.	4.04 ± 0.73	-0.39	-0.10	0.63
23. I communicate things with a good sense of humor to calm others or to generate joy in them.	4.10 ± 0.63	-0.08	-0.50	0.57
24. I propose constructive solutions to conflictive situations.	4.10 ± 0.77	-0.45	-0.38	0.46
25. I can express my opinions and feelings with serenity and confidence.	4.16 ± 0.66	-0.18	-0.74	0.68
26. I deal with conflict situations, considering the feelings and interests of the students.	4.27 ± 0.67	-0.38	-0.80	0.74
27. I listen attentively and allow them to communicate effectively with me.	4.37 ± 0.64	-0.52	-0.66	0.67
28. I maintain healthy interpersonal relationships with my colleagues and students.	4.44 ± 0.60	-0.53	-0.63	0.65
29. I like to contribute to the social welfare of the community or group to which I belong.	4.40 ± 0.67	-0.75	-0.15	0.57
30. I am interested in generating positive experiences in my professional and personal life.	4.35 ± 0.68	-0.64	-0.35	0.38
31. I act in an ethical manner and value my moral behaviors in all areas.	4.48 ± 0.59	-0.61	-0.58	0.70
32. I consider that I set a good life example for my students.	4.46 ± 0.65	-0.87	0.12	0.68
33. I seek to achieve positive goals in my community, such as tree planting, landscaping, or other similar activities.	3.84 ± 0.80	-0.32	-0.29	0.51
34. I motivate my students to undertake socially responsible actions.	4.34 ± 0.75	-0.78	-0.41	0.57

Evidence of content-based validity

To verify the quality of the formulated items, after applying the scale, the opinion of eight experts was consulted and they evaluated the items according to the criteria of clarity, pertinence, and relevance of the items, on a scale from one (not acceptable) to five (completely acceptable). Their evaluations were synthesized using the Aiken V index and their 95% confidence intervals.

As shown in Table 2, all items exceeded the cutoff of 0.70 and the lower limit of the 95% CI of 0.59 (Penfield & Giacobbi, 2004). For the lower bound Aiken's V values ranged between 0.65 and 0.89. This indicates that the items present clarity in their wording, are relevant to the construct measured, and are relevant to assess the content domain, according to the judges' judgment.

Table 02
Aiken's V coefficients with confidence intervals

	Clarity		Relevance		Relevance	
	M	V [IC95%]	M	V [IC95%]	M	V [IC95%]
Item 1	4.63	0.91 [0.76, 0.97]	4.75	0.94 [0.80, 0.98]	4.75	0.94 [0.80, 0.98]
Item 2	4.38	0.85 [0.68, 0.93]	4.38	0.85 [0.68, 0.93]	4.38	0.85 [0.68, 0.93]
Item 3	4.50	0.88 [0.72, 0.95]	4.63	0.91 [0.76, 0.97]	4.63	0.91 [0.76, 0.97]
Item 4	4.63	0.91 [0.76, 0.97]	4.75	0.94 [0.80, 0.98]	4.75	0.94 [0.80, 0.98]
Item 5	4.13	0.78 [0.61, 0.89]	4.25	0.81 [0.65, 0.91]	4.25	0.81 [0.65, 0.91]
Item 6	4.25	0.81 [0.65, 0.91]	4.25	0.81 [0.65, 0.91]	4.13	0.78 [0.61, 0.89]
Item 7	4.25	0.81 [0.65, 0.91]	4.50	0.88 [0.72, 0.95]	4.63	0.91 [0.76, 0.97]
Item 8	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 9	4.63	0.91 [0.76, 0.97]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 10	4.13	0.78 [0.61, 0.89]	4.75	0.94 [0.80, 0.98]	4.88	0.97 [0.84, 1.00]
Item 11	4.63	0.91 [0.76, 0.97]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 12	4.88	0.97 [0.84, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 13	4.25	0.81 [0.65, 0.91]	4.75	0.94 [0.80, 0.98]	4.88	0.97 [0.84, 1.00]
Item 14	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 15	4.63	0.91 [0.76, 0.97]	4.38	0.85 [0.68, 0.93]	4.38	0.85 [0.68, 0.93]
Item 16	4.88	0.97 [0.84, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 17	5.00	1.00 [0.89, 1.00]	4.38	0.85 [0.68, 0.93]	4.50	0.88 [0.72, 0.95]
Item 18	4.75	0.94 [0.80, 0.98]	4.25	0.81 [0.65, 0.91]	4.25	0.81 [0.65, 0.91]
Item 19	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]
Item 20	5.00	1.00 [0.89, 1.00]	4.38	0.85 [0.68, 0.93]	4.50	0.88 [0.72, 0.95]
Item 21	5.00	1.00 [0.89, 1.00]	4.13	0.78 [0.61, 0.89]	4.13	0.78 [0.61, 0.89]
Item 22	4.63	0.91 [0.76, 0.97]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 23	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]
Item 24	5.00	1.00 [0.89, 1.00]	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]
Item 25	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 26	5.00	1.00 [0.89, 1.00]	4.63	0.91 [0.76, 0.97]	4.63	0.91 [0.76, 0.97]
Item 27	4.75	0.94 [0.80, 0.98]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 28	4.25	0.81 [0.65, 0.91]	4.38	0.85 [0.68, 0.93]	4.38	0.85 [0.68, 0.93]
Item 29	4.13	0.78 [0.61, 0.89]	4.88	0.97 [0.84, 1.00]	4.88	0.97 [0.84, 1.00]
Item 30	4.25	0.81 [0.65, 0.91]	4.63	0.91 [0.76, 0.97]	4.75	0.94 [0.80, 0.98]
Item 31	4.13	0.78 [0.61, 0.89]	4.75	0.94 [0.80, 0.98]	5.00	1.00 [0.89, 1.00]
Item 32	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]	5.00	1.00 [0.89, 1.00]
Item 33	4.25	0.81 [0.65, 0.91]	4.38	0.85 [0.68, 0.93]	4.38	0.85 [0.68, 0.93]
Item 34	4.50	0.88 [0.72, 0.95]	4.50	0.88 [0.72, 0.95]	4.50	0.88 [0.72, 0.95]

Evidence of validity based on the internal structure of the construct.

The 34 items of the Socio-Emotional Competencies Scale for Teachers were subjected to the exploratory factor analysis (EFA) technique to identify the structure of underlying factors. Previously, the assumptions for using this technique were tested (Abad et al., 2011), obtaining the following results: The overall Kaiser-Meyer-Olkin sample adequacy test was .928, indicating an optimal adequacy of the data for factor analysis. Bartlet's sphericity test (=2577.0, $p < .001$) ruled out the existence of a null or identity matrix, supporting the applicability of the EFA. On the other hand, the Mardia multivariate normality test (> 70) showed that the data do not have a normal distribution.

Based on the tests necessary to use factor analysis, and according to the questionnaire response scale, the robust diagonally weighted least squares (RDWLS) was chosen as the method of factor extraction. This method, recommended for ordinal scales and non-normal conditions, uses a diagonal weighting matrix that assigns a weight to each item based on the observed matrix, which in this case is the polychoric correlation matrix, to avoid incorrect standard errors (Yang-Wallentin et al., 2010).

Table 3 shows the factor loads of the items to the five factors identified by parallel analysis and under a robust Promin rotation method (Lorenzo-Seva & Ferrando, 2019). In the first factor (F1), it was observed that item 21 had a significant burden in two factors, which led to its elimination from the instrument. As a result, the first factor was made up of items 22 to 27. The second factor (F2) is composed of items 1 to 6, with notable factor loads (between 0.59 and 0.80). so they were removed from the questionnaire. As a result, items 8 to 12 were in the third factor.

Regarding the fourth factor (F4), item 20 was also identified as showing a higher burden on another factor, which led to its elimination from the questionnaire. As a result, the fourth factor consisted of six items, from 14 to 19, that presented adequate loads (between 0.556 and 0.684).

The third factor (F3) originally included seven items, but it was observed that items 7 and 13 had high loads in another factor or the difference in loads with another factor was less than 0.20.

Finally, the fifth factor was affected by the elimination of two crossed items (items 31 and 33), which led to the fifth factor being composed of items 28, 29, 30, 32 and 34.

Table 3
Internal structure of the Scale of Socio-Emotional Competencies in Teachers through exploratory factor analysis

Reagents	F1	F2	F3	F4	F5
Item 1	-0.17	0.80	0.19	0.04	0.12
Item 2	-0.06	0.70	0.05	0.07	0.11
Item 3	0.01	0.59	-0.12	0.19	-0.03
Item 4	0.15	0.61	0.18	0.08	-0.17
Item 5	0.12	0.70	-0.19	0.21	-0.01
Item 6	0.20	0.70	0.06	-0.32	0.02
Item 7*	0.12	-0.03	0.46	*0.33*	-0.11
Item 8	-0.16	0.13	0.50	0.16	0.03
Item 9	-0.16	0.34	0.89	-0.26	0.18
Item 10	0.13	-0.11	0.63	0.06	-0.08
Item 11	0.05	0.08	0.69	-0.15	-0.03
Item 12	0.09	0.08	0.45	0.25	-0.11
Item 13*	-0.25	0.14	0.26	*0.60*	0.01
Item 14	-0.07	-0.05	0.08	0.62	-0.02
Item 15	0.03	-0.04	0.26	0.56	0.18
Item 16	0.25	-0.07	0.17	0.55	-0.04
Item 17	0.10	-0.08	0.21	0.68	0.05
Item 18	0.00	0.08	0.06	0.68	0.07
Item 19	0.05	-0.07	0.13	0.58	0.19
Item 20*	0.00	-0.01	*0.45*	0.31	0.14
Item 21*	0.47	-0.22	-0.09	*0.43*	0.05
Item 22	0.66	0.13	-0.08	0.18	-0.09
Item 23	0.77	-0.01	0.13	-0.09	-0.01
Item 24	0.78	0.06	-0.17	-0.22	0.21
Item 25	0.64	0.16	-0.13	0.20	0.04
Item 26	0.55	0.01	0.13	0.06	0.05
Item 27	0.62	0.33	0.18	-0.12	-0.09
Item 28	-0.04	0.17	-0.10	0.23	0.55
Item 29	0.08	0.04	0.08	0.01	0.69
Item 30	0.19	-0.17	0.20	-0.24	0.69
Item 31*	-0.24	*0.32*	0.10	0.27	0.40
Item 32	-0.10	0.07	-0.05	0.41	0.68
Item 33*	0.01	-0.01	-0.15	*0.39*	0.46
Item 34	0.17	-0.04	-0.15	0.29	0.54

Note: F1: Social competence, F2: Recognition of one's own emotions and those of others, F3: Emotional regulation, F4: Emotional autonomy, F5: Competences for life and well-being.
* Indicates the items that will be eliminated due to low or cross factor loading. In bold, it indicates the items that correspond to its factor.

In summary, a rotated oblique structure of five factors of socio-emotional skills in teachers was found, confirming the original structure, where each factor is represented by five or six items, which have shown adequate factor loads. The overall rating indices showed a good fit (CFI = 0.99 and GFI = 0.92). Likewise, in terms of residue analysis, an RMSR = 0.05 and a WRMR = 0.03 were obtained, which indicates a good fit of the data (Abad et al., 2011; Yu & Muthen, 2002).

Analysis of the internal structure of the construct with confirmatory factor analysis

To determine the evidence of validity based on the internal structure of the construct for the Teacher's Socio-Emotional Competencies Scale, two factorial models were examined without considering the items excluded in the exploratory factor analysis process. Considering the categorical nature of the items, confirmatory factor analysis procedures were performed with the WLSMV (Diagonally Weighted Least Squares with Mean and Variance corrected) estimator. Figure 1 presents model 1, which shows a five-dimensional structure with high standardized factor loads ranging from 0.59 to 0.94, and interfactorial covariances ranging from 0.52 to 0.77. According to the global assessment indices, model 1 presents satisfactory fit ($\chi 2(gl)$ = 623.277(340), CFI = 0.971, TLI = 0.968, RMSEA = 0.059 [0.052, 0.067] and SRMR = 0.062) supporting the evidence of validity. Figure 1 also shows the presence of convergent and divergent validity since the factor loads are higher than the covariances between the factors.

As can be seen in Table 4, convergent validity is also reaffirmed through Average Variance Extracted (AVE) because its estimates were higher than 0.50 (recommended cut-off critical value). Also, the square root values of AVE were greater than 0.80 and greater than the interfactorial correlations (Figure 1), which means that there is satisfactory evidence of discriminant validity (Fornell & Larcker, 1981).

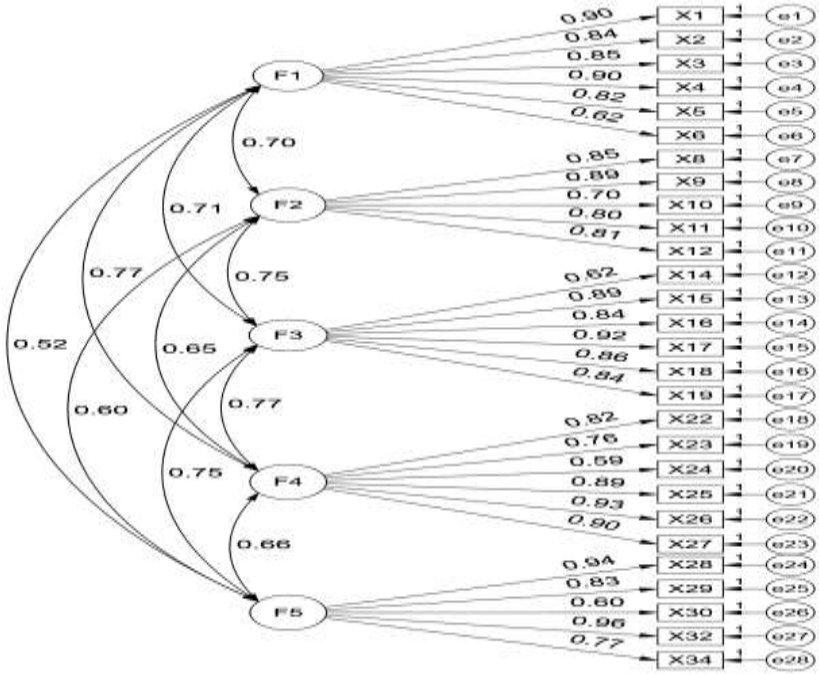

Figure 1
Multidimensional model of the internal structure of the construct Socio-Emotional Competencies of the teacher

Because the interfactorial covariances were almost entirely high (> 0.65), a bifactor model was analyzed (Figure 2). As can be seen in the results, a general factor represents the structure of the construct of the teacher's Socio-Emotional Competencies, with individual parameters higher than the relationships that are configured between the five specific factors and their respective items. This construct structure consisting of one general factor and five specific factors has very satisfactory overall goodness-of-fit indices ($\chi 2(gl) = 647.806(322)$, CFI = 0.967, TLI = 0.961, RMSEA = 0.065 [0.058, 0.073] and SRMR = 0.066).

To determine the model that best represents the factor structure of the construct (multidimensional model or bifactor model) and to avoid false positives, four indicators were considered for the assessment of the general factor: hierarchical omega (ωh), hierarchical H coefficient (Hh), explained common variance (LCS) and the percentage of uncontaminated correlations (PUC). As can be seen in Table 4, with respect to the two-factor model, the four indicators show values greater than 0.70, therefore, the data support the validity of a model of five specific factors with a general factor.

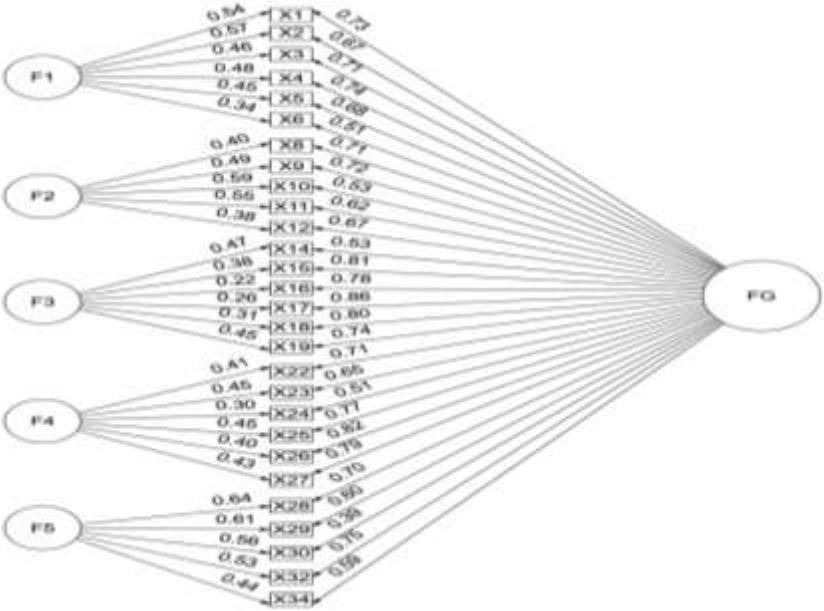

Figure 2
Two-factor model of the internal structure of the construct Socio-Emotional Competencies of the teacher

Evidence of reliability

Table 4 shows estimated internal consistency coefficients considering the ordinal nature of the items. For the multidimensional model, both ordinal alpha (α) and McDonald's omega coefficient (ω) denote high reliability (> 0.95) for the general scale and for its dimensions (> 0.90). Regarding the two-factor model, the hierarchical omega (ω h) and the hierarchical H coefficient (Hh) show a high reliability for the instrument's score.

Table 4
Measures of reliability and accuracy of factor structure

	$\alpha_{ordinal}$ [IC95%]	ω	ω_h	ECV	PUC	H_h		
General:	0.96 [.95, .97]	0.98	0.90	0.70	0.83	0.97		
Dimensions		ω	ω_{hs}				AVE	√ AVE
F1	0.92 [.90, .94]	0.93	0.31				0.68	0.82
F2	0.90 [.88, .92]	0.91	0.32				0.66	0.81
F3	0.92 [.90, .94]	0.93	0.16				0.69	0.83
F4	0.92 [.90, .94]	0.93	0.23				0.67	0.81
F5	0.91 [.89, .93]	0.92	0.42				0.68	0.82

DISCUSSION

The objective of this study was to evaluate the validity and reliability of the Socio-Emotional Competencies Scale of Teachers – ECSED, a new instrument aimed at university professors, based on the socio-emotional competencies model of Bisquerra and Pérez (2007). This model has also been the basis of other instruments to evaluate infants (Bartroli et al., 2022), children (Arias Sáciga, 2022), adults (Mikulic et al., 2015), and primary school teachers (García, 2022).

There are very few instruments to measure socio-emotional competencies and they have little scientific rigor. We did not find any research that adapts or generates instruments aimed at measuring the CSE of university professors. Comparative and relational studies are only evidenced in teachers who teach at the regular basic education level, in samples of teachers from different departments such as Lima (Carbonel, 2018), Piura (Peña, 2023), and La Libertad (Minaya, 2021). However, these studies report psychometric properties estimated with questionable methods of the instruments they used.

In a number of countries, there are better structured instruments for teachers of regular basic education. This is the case of the study by Fernández and Malvar (2019) in Spain, which gives an account of the scale of emotional competencies of counsellors, which combines socio-emotional and ethical aspects. Likewise, the construction of an interesting inventory by Mikulic et al. (2015) in Buenos Aires, to analyze Socio-Emotional Competencies (SSCI) in the general population, not specifically for university professors, is based on the construction of an interesting inventory by Mikulic et al. (2015) in Buenos Aires, to analyze Socio-Emotional Competencies (SSI) in the general population, not specifically for university professors.

In the context of the ideas expressed, given that the findings of the present study correspond to the construction of a new instrument, there are no antecedents with which to directly compare the evidence obtained, as is the case when a psychometric study corresponds to an adaptation. Therefore, the analysis of the data revolves around its practical as well as methodological and theoretical implications regarding the evaluation of socioemotional competencies in university teachers.

An important finding in the present study is the evidence of validity based on the content examined with a rigorous procedure such as the V of Aiken, which assesses the suitability of the Scale of Socio-Emotional Competencies for Teachers -ECSED based

on the fulfillment of criteria of clarity, relevance and relevance not only in a timely manner but also based on the lower limit of the 95% confidence interval for the V of Aiken that expresses the degree of agreement among the judges.

The quality of the domain of the contents examined on the ECSED scale is complemented and strengthened by the analysis of the items using the corrected homogeneity indices (IHC) that denote evidence of high discriminative capacity, because indices higher than the recommended cut-off value of 0.30 were found. This fact is important because when applying this scale to teachers, it is feasible to discriminate educators who show better interaction in personal and social situations, evidencing higher and healthier levels; of those other teachers whose interactions are poor and score low on global competence and on each of the dimensions. For this reason, decisions could be made for selective training and better suited to the individual differences of the teachers.

Regarding the evidence of validity based on the internal structure of the construct, the findings of the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) reaffirm the configuration of a five-factor model and 28 items in the Socio-Emotional Competencies Scale for Teachers. The EFA estimated with the method of parallel analysis and robust promin rotation was important not only to determine the number of factors that constitute the construct but also to identify items with low factor loads, with saturations in more than one factor or saturation in another factor. A robust procedure that allowed the consolidation of the multidimensional structure of the ECSED scale is the TFA, which showed global adjustment indices of very good fit that supports with empirical evidence the Bisquerra and Pérez (2007) for the construct of socio-emotional competencies. The presence of high interfactorial covariances observed in the multidimensional model justified the evaluation of a bifactor model that resulted in very good global fit indices (CFI = 0.967, TLI = 0.961, RMSEA = 0.065 and SRMR = 0.066) as well as the optimal additional indices (ωh = 0.90; Hh = 0.97; CVD = 0.70; PUC = 0.83) The model that best represents the factor structure of the construct is the model of five specific factors with a general factor. According to this result, the validity of obtaining scores for the general factor "Socio-Emotional Competencies of the teacher" and the five specific factors exposed in the study is supported. It is of interest to continue studying the structures in which the socio-emotional competencies of the teacher can be assessed, since there are bifactorial structure by validating questionnaires that assess socio-emotional competencies (Coelho & Sousa, 2020; Neto Dos Santos et al., 2022).

The factor loads of most of the items of the five factors identified by parallel analysis and by robust Promin rotation were validated by their high factor load. This implies that each of the dimensions explains the particular socio-emotional competence foreseen: F1: Social competence, F2: Recognition of one's own emotions and those of others, F3: Emotional regulation, F4: Emotional autonomy, F5: Competences for life and well-being. Likewise, the combination of them functionally explains the teacher's global socio-emotional competence. This was possible after eliminating a total of 6 items and the instrument was made up of 28 items that showed high factor loads. The exploratory global assessment showed a very high fit (CFI = 0.99 and GFI = 0.92), which was

validated to explain this general construct. Likewise, in terms of residue analysis, an RMSR = 0.05 and a WRMR = 0.03 were obtained, which indicates a good fit of the data (Abad et al., 2011; Yu & Muthen, 2002). These results coincide with those of Mikulic et al. (2015) who constructed the Socio-Emotional Competencies Inventory (ICSE). considering similar dimensions, such as emotional awareness, emotional regulation, emotional expression, empathy, prosocial, self-efficacy, assertiveness, optimism, and emotional autonomy. They found a matrix of items with factor weights greater than .30. They obtained a greater number of factors (9 factors) that explain 42.57% of the total variance: the dimensions of self-efficacy, optimism, assertiveness, emotional expression, emotional awareness, empathy, emotional regulation, prosocial and autonomy, where they found values between .60 and .89 in the applied instrument.

In this regard, Acevedo, et al. (2020) consider the relevance that these competencies of emotion recognition and emotion management are fundamental in the socio-emotional interaction of the student and the teacher, so that they perform better in the educational institution and in different social areas. In this sense, these competencies are vital for teachers to link up with learners and manage the training of citizens who need to live peacefully in multicultural societies, generating solidarity and integration. Similarly, to improve the practice of ethical values and positive attitudes towards oneself and others. As well as the positive disposition to contribute to the productive process, in the work function and in training for a healthy life.

As Rendón (2019) refers, socio-emotional education, then, should not only be oriented to students, it is also of utmost importance that it is a learning and acquisition for teachers; since, these will be the enablers of the education of the CSE of the students. Thus, CSE can be stimulated through teaching practices, since the latter are brought into play in interactions, in the daily teacher-student relationship. It is a challenge for research and for the training of future teachers, who will have to integrate themselves into educational contexts and face stressful life events that, according to the literature, are represented in violence, social exclusion, family conflict and the inability of schools to compensate for shortcomings and inequalities, among others.

The reliability of the instrument is very high (> 0.95) both for the overall scale and for its dimensions (> 0.90). When analyzing the hierarchical omega (ω h) and the hierarchical H coefficient (Hh) with the two-factor model, high reliability was found, which attests to the accuracy of the measurements.

The implications of the generation of this instrument can arise in two areas: applied research and the solution of challenges in university teaching. Regarding the first, the results of the psychometric construction of the ECSED need to be replicated in new samples of university professors, as well as to obtain new sources of evidence of validity, such as the relationship with other instruments or the analysis of the consequences of the application of the test. The good results obtained in this process of psychometric construction are expected to constitute a solid basis in this line of research.

Likewise, this instrument can be used in the global research of the performance of university professors. For example, in the study of basic education teacher performance,

socio-emotional competencies have been related to attitudes, adaptability, interpersonal and intrapersonal skills, empathy, and sociodemographic variables (Lozano-Peña et al., 2022).

Regarding the area of university education and the challenges it entails, the ECSED instrument can be used to carry out a rapid, reliable, and effective assessment of teachers' socio-emotional competencies, either globally or by dimensions. If a teacher scores low on any of the dimensions, future teacher training can focus on developing the competencies that scored low. For example, Pérez-Escoda et al. (2012) evaluated a sample of 92 Spanish teachers with the Emotional Development Questionnaire for Adults (CDE-A), based on the theory of Bisquerra and Pérez (2017), obtaining an overall score and specific scores for the five dimensions. These results were used for the development of a 30-hour emotional education program, which had a significant impact on the dimensions of emotional regulation and social competence.

A limitation to be noted is that the sample was taken in a cross-sectional section of the evaluation of the variable to the teachers, so it would be important to carry out a new longitudinal measurement, to interpret the results in the perspective of the evolution of the socio-emotional competencies of the teachers. In addition, an analysis of personal and contextual variables related to chronological age, place of origin, and length of work experience could be proposed. Thus, more specific decisions could be made for initial teacher and in-service training.

CONCLUSION

In conclusion, based on the purpose of this research and the findings contrasted with the background and theory, the following can be stated: 1) The instrument has the expected levels of validity and reliability, based on procedures and results with high scientific rigor. 2) The assessment of socio-emotional competencies can be planned and carried out with quantitative instruments such as this scale of the study and complemented with qualitative instruments, to make suitable decisions in the selection and management of teaching staff in higher education. 3) In order to better understand and value the concept and theories of socio-emotional competencies, the reciprocal influence of personal and contextual factors on their development must be considered, which allow the teacher to interact more effectively to promote meaningful student learning in the classroom and outside of it. 4) In future psychometric research of the ECSED, sociodemographic variables should be considered, which allow the specific analysis by sex, age and year of service of the teachers.

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